## REMARKS

The Office Action of May 29, 2008 has been reviewed and carefully considered.

Reconsideration of the above-identified application is respectfully requested.

**Status of the Application:**

Previously pending claims 1 to 9, with claim 1 being independent, remain pending in this application, and new claims 16 and 17 have been added. No new mater has been added.

In the Office Action of May 29, 2008, the Examiner rejected claims 1-9 under 35 USC §102(b) as allegedly anticipated by U.S. Patent No. 4,990,465 ("Liau") and claims 1, 2, 4, 5 and 8 under 35 USC §102(b) as allegedly anticipated by U.S. Patent No. 6,584,136 ("Ju"). Applicants, having carefully considered the Examiner's rejections, together with the comments provided in support thereof, respectfully traverse these rejections and submit that the invention as claimed is patentably distinct from the applied references, taken individually or in combination.

**Amendments:**

New claims 16 and 17, which ultimately depend from claim 1, have been added. Claim 16 recites that the radiation exit face is a polygon having an even number of sides, wherein the side faces are disposed obliquely with respect to the principal crystal direction and perpendicularly with respect to the radiation exit face. Claim 17 recites that the polygon is a rectangle. Support for these claims can be found in the specification as filed at page 4, lines 8-16 and Fig. 1.

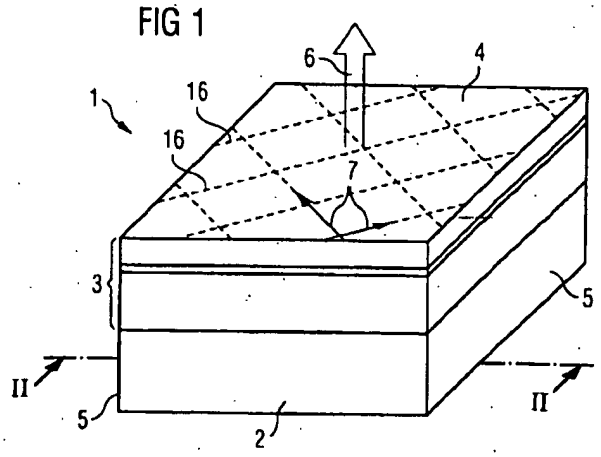
**Prior Art Rejections:**

The Examiner rejected claims 1-9 under 35 USC §102(b) as anticipated by U.S. Patent No. 4,990,465 ("Liau") and claims 1, 2, 4, 5 and 8 under 35 USC §102(b) as anticipated by U.S. Patent No. 6,584,136 ("Ju").

**The Present Disclosure**

Disclosed is a surface emitting semiconductor laser chip.[1] The semiconductor laser chip includes a semiconductor body that includes a radiation exit face, a crystal structure that includes principal crystal directions extending along a lateral direction of the radiation exit face, and side faces laterally delimiting the semiconductor body. At least one of the side faces is disposed obliquely with respect to the principal crystal direction and disposed perpendicularly with respect to the radiation exit face. An exemplary chip shown in Figure 1 of the present application is reproduced below.

FIG 1




**U.S. Patent No. 4,990,465 ("Liau")**

Liau discloses a method for forming a monolithic surface emitting laser diode array by providing vertical partly light transmissive mirror surfaces opposite parabolic light reflective mirror surfaces formed adjacent to the active buried layer of a heterostructure diode laser. (Abstract of Liau). As shown in Figures 7b through 7d, which are cross sections of the disclosed laser diode, and as discussed in Liau at column 9, line 61-column 10, line 54, mirror surfaces

[1] These descriptive details are provided only for the convenience of the Examiner as part of the discussion presented herein, and are not intended to argue limitations that are not claimed. Further, this is not intended to argue any interpretation of any claim term that is narrower than would be understood by one of ordinary skill in the art in the context of the specification and the claims as a whole.

104' are crystallographic 45° light reflective mirrors fabricated adjacent the light emitting edge of a buried active layer diode laser. Laser radiation is directed at a 90° angle to the plane of the active layer and out the substrate surface to provide a surface emitting laser diode structure. (Liau at col. 9, lns 63-68).

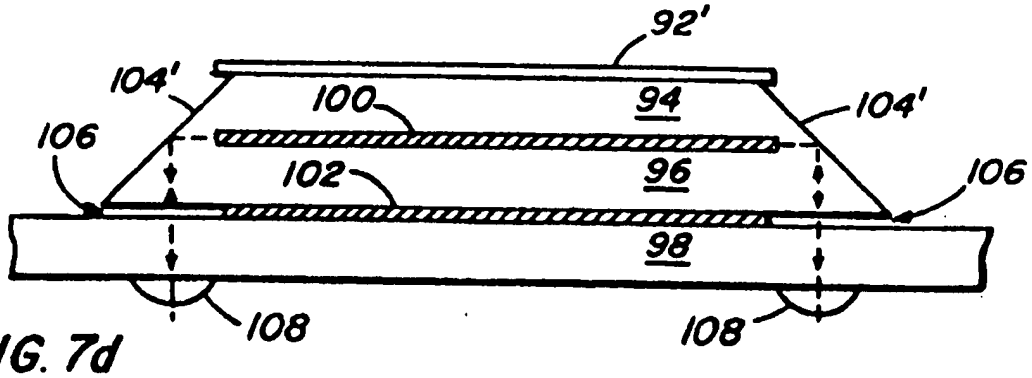


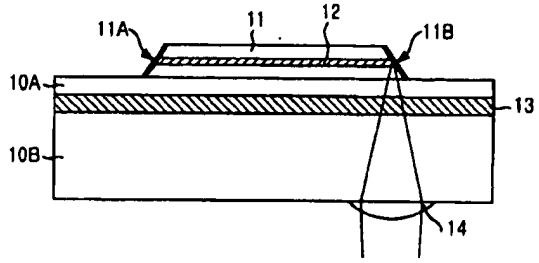
FIG. 7d

Liau does not disclose side faces laterally delimiting said semiconductor body, at least one of said side faces disposed obliquely with respect to said principal crystal directions and perpendicularly with respect to said radiation exit face, as Applicants' claims recite. In Liau, surfaces 104 underlying the oxide mask are formed at a 45° angle to the plane of the p-n junction device. The 45° angle is obtained by virtue of the fact that the crystallographic plane of the top layer 94 is oriented with the 001 plane being at the long face of the active layer and the 010 plane being oriented normal thereto. (Liau at col. 9, lns. 23-28). As shown in Fig. 7d reproduced above, surface 104' is arranged at a 45° angle with respect to the radiation exit face. If surface 104' were arranged perpendicular to the exit face, as required by Applicants' claims, the reflective mirrors would not reflect the light out through the bottom of substrate 98 as shown in Figure 7d. In other words, an angle of 45° with respect to the substrate surface is required in the structure of Liau for transmission out through the surface.

U.S. Patent No. 6,584,136 ("Ju")

Ju discloses a folded cavity laser for generating a laser beam. Specifically, first and second mirrors are formed on sides of the active medium for making a horizontal cavity for reflecting the amplified laser beam to a microlens. (See e.g., Abstract and Figure 1 of Ju). As disclosed in Ju, reflecting mirrors 11A, 11B are formed on the active medium 12. As shown in Fig. 1 reproduced below, reflecting mirrors 11A and 11B are inclined at an angle of, e.g., approximately 45°, with respect to the axis of the active medium 12. (See Ju at col. 3, lns. 20-25). Thus, the light beam changes its path approximately 90° at the side surfaces 11A and 11B.

FIG. 1




Ju does not disclose side faces laterally delimiting said semiconductor body, at least one of said side faces disposed obliquely with respect to said principal crystal directions and perpendicularly with respect to said radiation exit face, as Applicants' claims recite. Ju is silent with respect to the crystal direction of the radiation exit face. As shown in Fig. 1, surfaces 11A and 11B are arranged at a 45° angle with respect to the radiation exit face. If surface surfaces 11A and 11B were arranged perpendicular to the exit face, as required by Applicants' claims, the reflective mirrors would not reflect the light out through the bottom of the substrate as shown above. In

other words, an angle of 45° with respect to the substrate surface is required in the Ju structure for transmission out through the surface.

**Claims 1-9, 16, and 17 are not Anticipated by Liau**

Independent claim 1 explicitly recites "side faces laterally delimiting said semiconductor body, at least one of said faces disposed obliquely with respect to said principal crystal directions and perpendicularly with respect to said radiation exit face."

There is no mention or suggestion of side faces disposed perpendicularly with respect to the radiation exit face in the Liau reference at column 9, lines 60-68 (cited by the Examiner). Additionally, Applicants note that Liau fails to disclose one of said faces disposed obliquely with respect to said principal crystal directions. In Liau, the principal crystal direction is oriented at the long face of the active layer. Thus, two of the side walls are disposed parallel to the principal crystal direction and two side walls are perpendicular to the principal crystal direction. Liau also explicitly discloses side walls 104' that are disposed at a 45° angle with respect to the radiation exit face. Thus, Liau fails to disclose Applicants' claimed side faces disposed obliquely with respect to said principal crystal direction and perpendicularly with respect to said radiation exit face.

Therefore, the limitations recited in independent claim 1 are not disclosed in Liau and claim 1 is accordingly deemed to be patentable over Liau.

Claims 2-9, 16 and 17 depend from, and contain all of the limitations of, claim 1. These dependent claims also recite additional limitations which, in combination with the recitations of claim 1, are neither disclosed nor suggested by Liau and are also directed towards patentable subject matter. Thus, claims 2-9 should also be allowed.

**Claims 1, 2, 4, 5, 8, 16 and 17 are not Anticipated by Ju**

Among the limitations of independent claim 1 not present in the Ju reference is "side faces laterally delimiting said semiconductor body, at least one of said faces disposed obliquely with respect to said principal crystal directions and perpendicularly with respect to the said radiation exit face."

Like Liau discussed above, Ju fails to disclose the explicitly recited side faces disposed obliquely with respect to said principal crystal direction and perpendicularly with respect to said radiation exit face. Although the Examiner states that Ju describes the above quoted limitation at column 3, lines 20-32, Applicants submit that there is no specific mention or reference to side faces disposed as recited in Applicants' claims. In fact, the cited portion of Ju, like Liau above, states that the side surfaces 11A and 11B are inclined at approximately 45° with respect to the axis of the active medium whereby the light changes its path approximately 90°. Additionally, Ju is silent with respect to one of the faces being disposed obliquely with respect to the principal crystal directions. Therefore, Ju fails to anticipate claim 1.

Claims 2, 4, 5, 8, 16 and 17 depend from and contain all of the limitations of claim 1. These dependent claims also recite additional limitations which, in combination with the limitations of independent claim 1, are neither disclosed nor suggested by the cited reference and are also directed toward patentable subject matter. Thus, claims 2, 4, 5 and 8 should also be allowed.

**Conclusion**

In view of the foregoing, it is respectfully submitted that the present invention as recited in the claims is patentably distinct over Liau and Ju, whether taken alone or in combination. Both Liau and Ju disclose an arrangement of side faces with respect to the radiation exit face unlike that

explicitly recited in claim 1. Furthermore, neither Liau nor Ju provide any reason for arranging the side surfaces at set forth in claim 1.

Applicants have responded to all of the rejections recited in the Office Action. Reconsideration and a Notice of Allowance for all of the pending claims are therefore requested.

If the Examiner believes that an interview would be of assistance, the Examiner is encouraged to contact the undersigned at the number listed below.

It is believed that no fees or charges are required at this time in connection with the present application. However, if any fees or charges are required at this time, they may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,
COHEN PONTANI LIEBERMAN & PAVANE LLP

By _____

Lance J. Lieberman
Reg. No. 28,437
551 Fifth Avenue, Suite 1210
New York, New York 10176
(212) 687-2770

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